

U.S. Department of Energy Building Energy Codes Program

Provider Number: **I014**

Two Experiences: A Deep Dive into Energy Codes East and West

Course Number: **EC15-W02**

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Date: **March 25, 2015**



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Course Description

Take a closer look at residential and commercial energy code content from two very unique parts of the country. First, Appalachian State University will show you the bad, the good, and the best when it comes to residential energy code compliance in North Carolina. Then, the City of Seattle will provide a look into one of the more progressive, and rapidly improving, commercial codes in the United States. Expect lots of pictures, technical details, and lessons learned in development, adoption, and compliance – suitable for code junkies and novices alike.

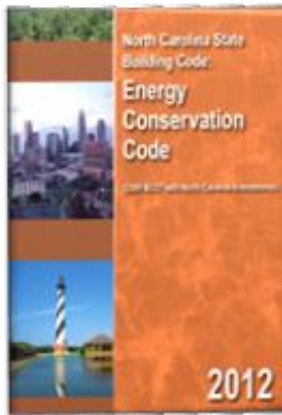
Learning Objectives

At the end of the this course, participants will be able to:

- Identify under-enforced provisions and methods to improve compliance.
- Review technical details contained in progressive residential and commercial energy codes.
- Learn about new compliance paths contained in progressive residential and commercial energy codes.
- Discuss building stakeholder relationships and how it can lead to tangible benefits and improved compliance.

Deep Dive into the NC RESIDENTIAL Energy Code

Lessons from the Field The Good, the Bad and the BEST



Presented By:

Chuck Perry

NCEEAA Program Director

Appalachian State University

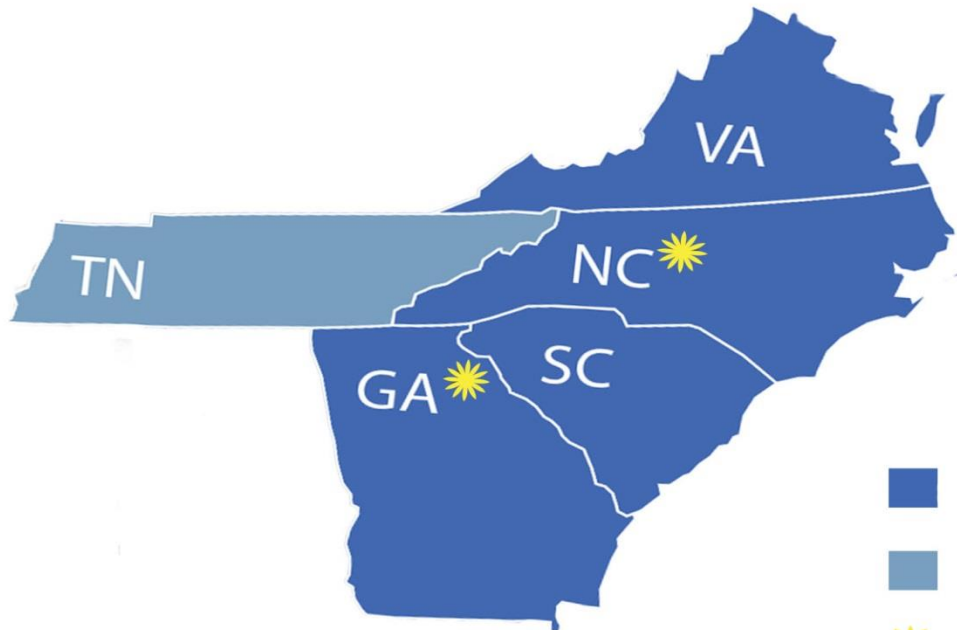


NC Residential Code Adoption

- Building Code Council
- 2009/2012 IECC → NC Energy Code
- Interested Parties in abundance (HBA's, Environmental Groups, NCDOL, Policy Groups, Manufacturers, Utilities, Raters, Builders, Appalachian State.
- Concerns in abundance (cost, savings, builder bottom line, appraisal value, fixtures vs. lamps, who tests?, ACH?, etc.)
- **COMPRIMISE = NC V. 2010.5 + H.E.R.O Code**

Residential State Energy Code Status

As of February 1, 2014



- Implemented 2009 IECC
- Implemented 2006 IECC
- ★ Written amendments to the 2009 IECC

Implementation Issues

- Education provided \neq Increase in efficiency
 - For both builders and inspectors
- Inconsistent enforcement
- Inconsistent interpretation
- When to test?
- The legislature

Key Changes and Interpretations

- Duct testing - Leakage to the Outside added
- Band Insulation
- ↑ SHGC in Section 405 (for passive solar)
- Low E reflectivity
- 6 year code cycle
- Provided a great launching pad for HP homes

From the Field -The BEST-







TABLE 401.9 ENERGY EFFICIENCY CERTIFICATE

Builder, Permit Holder or Registered Design Professional

Date:

| Insulation Rating – List the value covering largest area to all that apply | R - Value |
|--|-----------|
| Ceiling/roof: | R - 38 |
| Wall: | R - 15 |
| Floor: | R - - |
| Closed Crawl Space Wall: | R - - |
| Closed Crawl Space Floor: | R - - |
| Slab: | R - 9 |
| Basement Wall: | R - - |
| Fenestration: | |
| U-Factor | .3 |
| Solar Heat Gain Coefficient (SHGC) | .29 |

Building Air Leakage

- ☐ Visually inspected according to 402.4.2.1 OR
- ☐ Building Air Leakage Test Results (Sec. 402.4.2.2)
ACH50 [Target: 5.0] or
CFM50/SFSA [Target: 0.30]

Name of Tester/Company: SKHTECH

Date: 12/08/14 Phone: 846-759-3832

Ducts:

| | |
|--|-------|
| Insulation | R - 8 |
| Total Duct Leakage Test Result (Sect. 403.2.2) (CFM25 Total/100SF) [Target: 6] | 3.7 |

Name of Tester/Company: SKHTECH

Date: 12/08/14 Phone: 846-759-3832

Certificate to be displayed permanently

3.9

APPENDIX E-1 ENERGY EFFICIENCY CERTIFICATE N1101.9 or NCECC 401.3

This home has been independently verified to meet the energy efficiency requirements of the 2012 NC ENERGY CONSERVATION CODE

PROPERTY

BUILDER NAME

BUILDER SIGNATURE

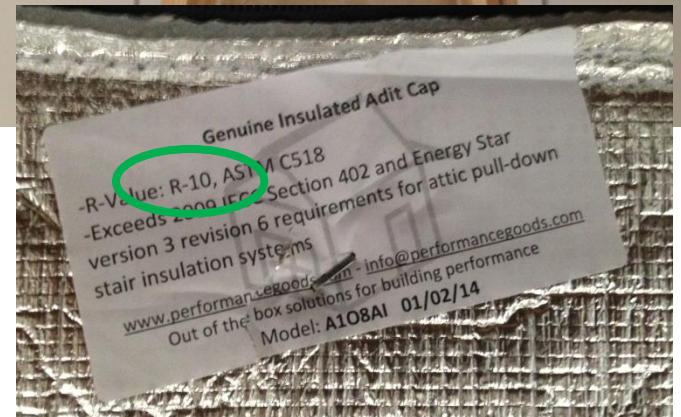
| INSULATION RATING | R-VALUE* | BUILDING AIR LEAKAGE |
|---|----------|--|
| CEILING/ROOF | 38 | Visually inspected according to §N1102.4.2.1 or §NCECC 402.4.2.1 <input checked="" type="checkbox"/> |
| WALL | 15 | AND / OR |
| FLOOR | 19 | Building Air Leakage Test Results (§N1102.4.2.2) (TARGET: ≤ 5 ACH50) 3.98 ACH50 |
| CLOSED CRAWL WALL (IF APPLICABLE) | - | |
| CLOSED CRAWL FLOOR (IF APPLICABLE) | - | |
| SLAB (IF APPLICABLE) | - | HVAC DUCTS |
| BASEMENT WALL (IF APPLICABLE) | - | INSULATION (Cond.) 8 |
| | | INSULATION (Uncond.) 4.2 |
| <input type="checkbox"/> Visually inspected tub, shower, fireplace units, stairs §N1102.2.12 or §NCECC 402.2.12 | | DUCT LEAKAGE CFM25/100SF |
| <input type="checkbox"/> Home meets the Simulated Performance Alternative (PERFORMANCE OPTION) (IF APPLICABLE) | | 1 (§NCECC 403.2.2) 3.3 |
| | | SYSTEM 2 (§NCECC 403.2.2) (IF APPLICABLE) - |
| | | SYSTEM 3 (§NCECC 403.2.2) (IF APPLICABLE) - |
| | | TOTAL DUCT LEAKAGE 3.3% |
| | | TESTER A. Zaytown |
| | | TESTING COMPANY SOUTHERN ENERGY MANAGEMENT |
| | | PHONE (919) 836-0330 |
| | | TESTING DATE 10/23/14 |

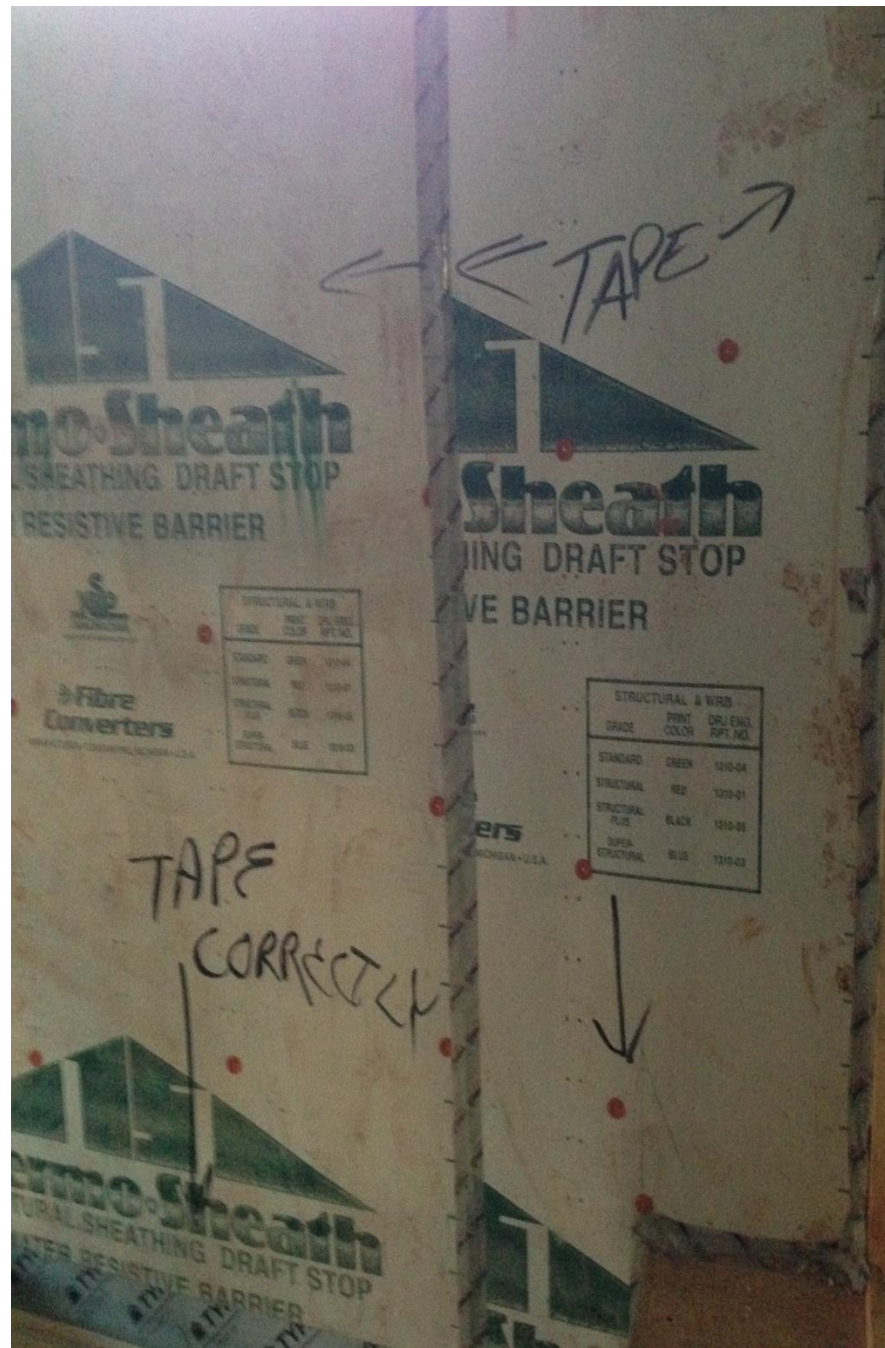
*Values listed indicate predominant rating found in home

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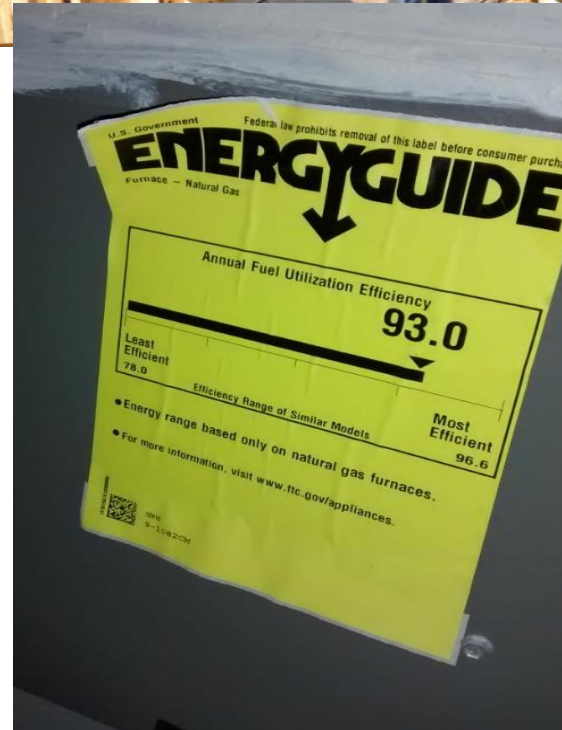
















From the Field

-The Good and the Ugly-





A photograph showing the exterior of a house with white horizontal siding. The ground in front of the house is covered with dry, yellowish-brown grass and some green weeds. A large red 'X' is superimposed on the left side of the image, pointing towards the base of the house. On the right side, there is a red speech bubble containing the text 'Insulation please'.

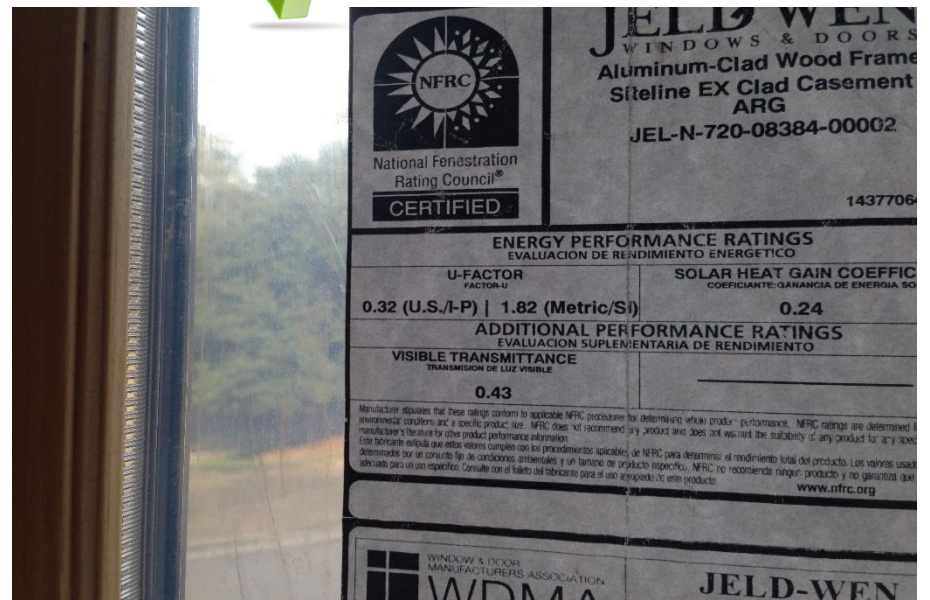
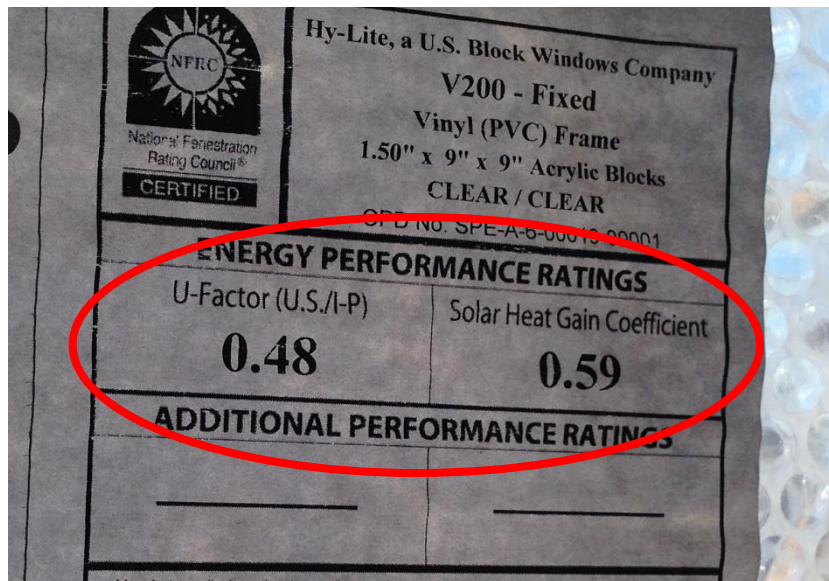
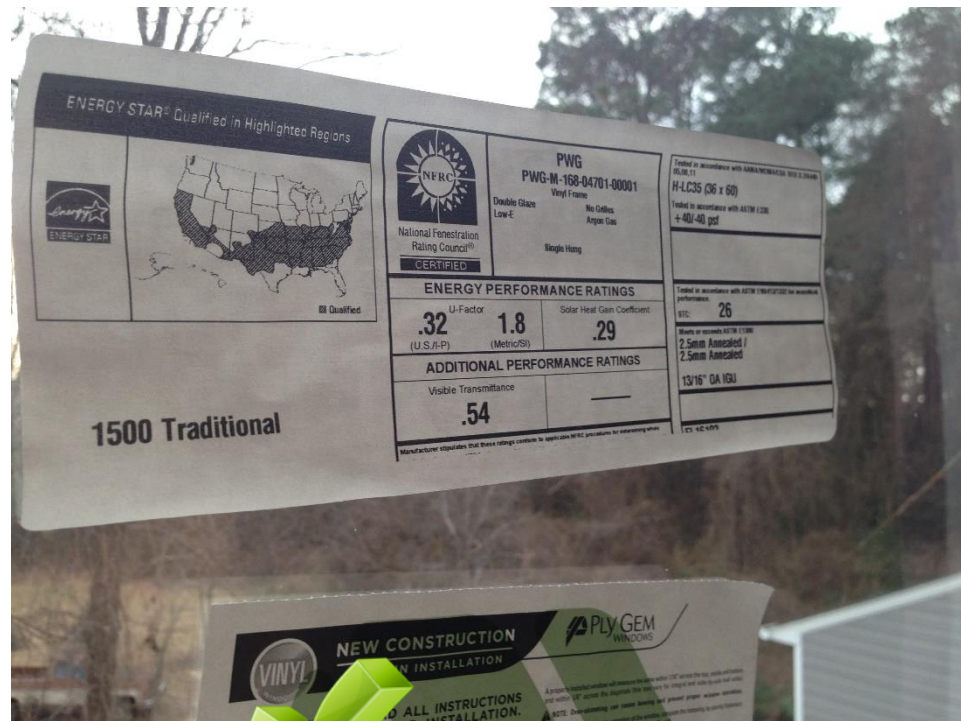
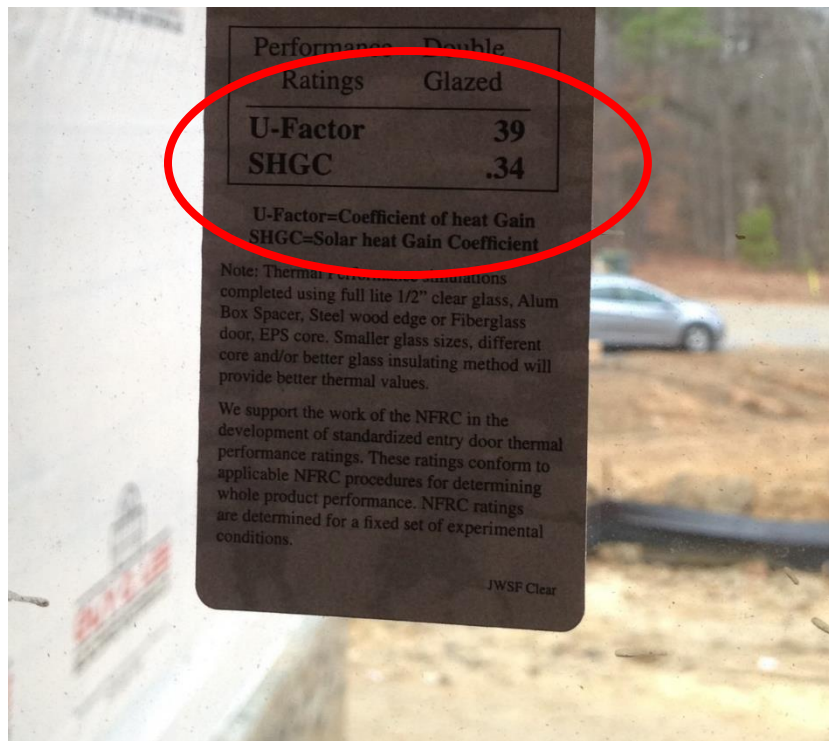
**Insulation
please**

| Insulation Rating - List the value covering largest area to all that apply | | R-Value |
|--|--------|---------|
| Ceiling/roof: | | |
| Wall: | | R- |
| Floor: | | R- |
| Closed Crawl Space Wall: | | R- |
| Closed Crawl Space Floor: | | R- |
| Slab: | | R- |
| Basement Wall: | | R- |
| Fenestration: | | |
| U-Factor | | |
| Solar Heat Gain Coefficient(SHGC) | | |
| Building Air Leakage | | |
| <input type="checkbox"/> Visually inspected according to 402.4.2.1 OR | | |
| <input type="checkbox"/> Building Air Leakage Test Results (Sec. 402.4.2.2) | | |
| ACH50 [Target: 5.0] | | |
| or CFM50/SFSA [Target: 0.30] | | |
| Name of Tester / Company: | | |
| Date: | Phone: | |
| Ducts: | | R- 8 |
| Insulation | | 2.2 % |
| Total Duct Leakage Test Result (Sect. 403.2.2) (CFM25 Total/100SF) [Target: 6] | | |
| Name of Tester or Company: ESG ENERGY | | |
| Date: 7-22-14 Phone: 800-964-3465 | | |
| Certificate to be displayed permanently | | |

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| Insulation Rating - List the value covering largest area to all that apply | | R-Value |
|--|----------------------------|---------|
| Ceiling/roof: | | R- 38 |
| Wall: | | R- 15 |
| Floor: | | R- - |
| Closed Crawl Space Wall: | | R- - |
| Closed Crawl Space Floor: | | R- - |
| Slab: | | R- 9 |
| Basement Wall: | | R- - |
| Fenestration: | | |
| U-Factor | | .3 |
| Solar Heat Gain Coefficient (SHGC) | | .29 |
| Building Air Leakage | | |
| <input type="checkbox"/> Visually inspected according to 402.4.2.1 OR | | |
| <input type="checkbox"/> Building Air Leakage Test Results (Sec. 402.4.2.2) | | |
| ACH50 [Target: 5.0] or CFM50/SFSA [Target: 0.30] | | |
| Name of Tester/Company: SKYTRAK | | |
| Date: 12/08/14 | Phone: 800-759-3832 | |
| Ducts: | | |
| Insulation | | R- 8 |
| Total Duct Leakage Test Result (Sect. 403.2.2) (CFM25 Total/100SF) [Target: 6] | | 3.7 |
| Name of Tester/Company: SKYTRAK | | |
| Date: 12/08/14 | Phone: 800-759-3832 | |
| Certificate to be displayed permanently | | |

3.9





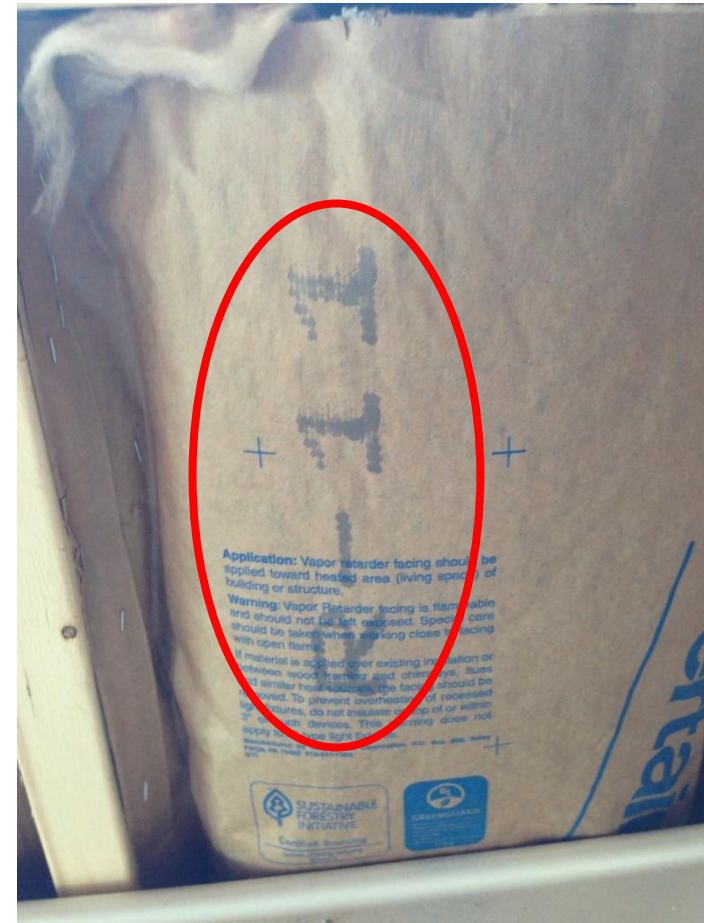
























Which
is
RIGHT?





Next Steps for NC (Residential)



- A+ Compliance
- HERS raters and compliance
- Whole home tightness –how low can we go?
- Duct tightness
- Envelope improvements such as C.I. ??

Commercial Code Adoption

- 2012 ? IECC → NC Energy Code
- Interested Parties **NOT** in abundance
- Issues **IN** abundance → RESULTING IN:
 - Interested parties arriving **IN** abundance
 - 6 year code cycle
 - Legislative action – HB 201
 - Adoption of ASHRAE 90.1 – 2010 (12% reduction)
 - Reductions in prescriptive fenestration

Questions?



North Carolina
Energy Efficiency
Alliance

NCENERGYSTAR.ORG



Appalachian Energy Center
APPALACHIAN STATE UNIVERSITY

ENERGY.APPSTATE.EDU

